SPE
NEWS

# NEWS

Issued Monthly to all Members of the Society of Plastics Enngineers

Vol 2 No. 7 September, 1946


# WHAT THE PLASTICS ENGINEER SHOULD KNOW

By HERBERT SPENCER

Undoubtedly the industrial engineer has a better acquaintance with plastics today than he and those of his calling had before the war. Frequently, however, he is confused regarding the characteristics of plastics and quite generally he is but briefly acquainted with the chemical and physical differences. He is uncertain which materials are transparent and come in sheets, and which are resistant to alcohol, and where to secure a strong material that might be used as a motor housing.

In his uncertainty his best course is to talk with a plastics engineer and to present his problem and contemplated use for a plastic material. The plastics engineer must not proceed as a know-it-all but remember to respect a man's knowledge of his own business though he may be vague in his understandings of plastics and their practical use.

It should not be expected, for example, that the engineer planning a part would know the engineering conditions that would make the part a better, easier, and less expensive job to mold. The flow characteristics during the molding process may require inside corners and "break" outside corners to aid the flow of material in the mold. Unless the industrial engineer is experienced in the use of plastics, he will seldom give sufficient consideration to the mold construction and molding.

The industrial men, particularly those of the older school, are far better acquainted with metal, which they are handling, than with what they can do with plastics. This is understandable, for their schooling and their experience until recently had little to say or do with plastics.

The industrial engineer is apt to be a little careless and unintentionally so; for plastics, while they have joined the basic materials group, cannot be handled like metal. The impact strength of even the stronger phenolic plastics is considerably below that of aluminum or magnesium alloys. The tensile strength is about one-tenth that of stamped steel. Therefore, it is evident that a different approach must be adopted if one is to obtain successful, structural molded parts. In his turn the plastics engineer, with a desire for the job under normal conditions in competitive selling, cannot afford to skimp on wall structure or neglect to get sufficient material around attachment inserts.

One of the greater contributions that the plastics engineers make is the proper selection of the material for the job at hand. The proper selection of

(Continued on page 10)

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With this issue, SPE News inaugurates a series of "Guest Editorials" by editors and other professional writers who are well known in the plastics industry. Our "Guest" this month is Mr. H. S. (Herb) Spencer, Advertising Manager of Durez Plastics and Chemicals, Inc., and head man of that lively publication "Durez Molder."

Herb Spencer came to the plastics industry in 1926 when the industry was small and Durez was very young. Since then, the promotional work and advertising of Durez has been directed toward opening many new avenues for molding materials and resins with amazing results.

When we asked him what he did before he entered plastics, his answer was direct though not too satisfactory. He said, "I worked." Pressed for more information, he stated, "I was in business before I left grade school." When asked what kind of business, he replied, "Mostly selling. I had my own business when I was fourteen and had six youngsters on my payroll."

# SPE NEWS

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*Under the Direction of* THOMAS E. ORR
Chairman National Publications Committee
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JESSE DAY, *Editor*
CASE SCHOOL OF APPLIED SCIENCE
CLEVELAND 6, OHIO

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## SPE PLASTICS SHOW

Plans are moving forward for the Third SPE Plastics Show, to be held in Chicago, January 28 through February 2 in conjunction with the Annual Technical Meeting. The Show will be held at Navy Pier and the technical sessions will be in the Congress Hotel, according to Jean Reinecke, General Chairman of the Show Committee.

In the June issue of SPE News, it was erroneously announced that the 1947 Show would be held in Chicago Coliseum. The Coliseum was considered by the Committee but later rejected in favor of Navy Pier. The Pier is larger, better located and has adequate parking facilities and accessible public transportation.

Opening the show on Tuesday and closing on Sunday will enable exhibitors to avoid week-end double time labor costs for moving their displays in and out of Navy Pier.

A series of special events and shows each evening, to provide both education and entertainment, will be highlights of the show.

Mr. Reinecke states that the technical sessions will be held in the mornings only on Tuesday, Wednesday, Thursday and Friday. The Show hours will be 1:00 P.M. to 10:00 P.M., with attendance restricted between 1:00 P.M. and 4:00 P.M. to SPE members and registered executives and engineers on Tuesday through Friday. The public will be admitted after 4:00 P.M. Tuesday through Friday and from 1:00 P.M. to 10:00 P.M. on Saturday and Sunday.

There is no registration fee or admission charge for SPE Members. A registration fee of $3.00 will be charged to non-members which will permit daily attendance to the Show and to the technical meetings. The public admission charge to the Show will be $1.00.

Technical papers on a wide variety of plastics subjects by outstanding engineers and scientists are being arranged in cooperation with the SPE Professional Activity Groups, according to Mr. Reinecke.

Several hundred rooms have been reserved for the week at the Congress Hotel according to Ed. Richards of the Hotels Committee, and advance reservations are already being accepted.

(Continued on page 14)

**Technical Article in this Issue**

**The Development of Synthetic Rubber in America ---------- Page 3**

By R. F. Dunbrook

## SPE NATIONAL ORGANIZATION

**By T. E. ORR, National Secretary**

In one Section recently the query was put "What is SPE as a National Organization doing for the geographical Section and the individual member?" This brief article is an effort to answer this question.

The policy of SPE is to have strong, self-reliant geographical Sections. The policy is evidenced by the large division of dues and initiation fees which is placed at the disposal of Sections and of new Sections. In no other engineering organization does such a large percentage of dues go to the Sections. Before the first of the current year, some Sections had larger treasuries than the National Organization. The Sections are self-governing organizations within the structure of the Constitution and By-Laws. The result has been that the Sections have displayed great local initiative and zealously guard the prerogatives of the Sections and members and when called upon to sponsor the National Meeting and Exhibit go "all-out" in the great amount of local work and cooperation required for success. The wisdom of this policy has been shown amply.

(Continued on page 13)

## TECHNICAL PAPER CONTEST

The National Publications Committee announces a National Contest for the best original technical paper prepared by any member of SPE on any phase of plastics.

Each Section Board of Directors will select the best paper submitted by an affiliate of the Section and all papers must be in the hands of the Section President by December 1, 1946.

The paper selected by each Section will be submitted to the Publications Committee which will establish a special sub-committee of judges, and will select one from the group as the National winner by December 31, 1946.

The paper selected by the committee of judges will be presented by the author in person at the Technical Sessions of the National Annual Meeting to be held in the Congress Hotel, Chicago, in January 1947. The author of the winning paper will be reimbursed for his expenses in attending the Chicago Meetings and will receive a suitable memorial in recognition of the award.

The Publications Committee reserves the right to publish the award paper and any of the Section winning papers in SPE News.

Any members who wish to enter the contest should notify Mr. T. E. Orr, Chairman Publications Committee (8506 Lake Avenue, Cleveland, Ohio) as soon as possible.

# THE DEVELOPMENT OF SYNTHETIC RUBBER IN AMERICA

By R. F. DUNBROOK
*Chemical and Physical Research Laboratories*
*The Firestone Tire & Rubber Co.*

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## Historical

The development of synthetic rubber in America extends over a period of almost 40 years and dates back to the year 1910. The rapid development of the synthetic rubber industry after Pearl Harbor would have been impossible had it not been for the research work which was done over a period of many years.

The term synthetic rubber is a misnomer since none of the different types of synthetic rubber of today are identical in structure and properties to natural rubber. A true synthetic rubber would have to be identical to the natural product in all respects and such a synthesis has never been accomplished even in the laboratory. The so called synthetic rubbers are elastic rubber-like materials which resemble natural rubber in many of their physical properties but which differ from it in chemical structure.

There are certain fundamental economic reasons for the development of a synthetic rubber industry. They are (1) to assure an adequate supply of rubber at a cheap or stable price, (2) to establish national self-sufficiency and a continuous supply of rubber, and (3) to develop a synthetic material superior to the natural product. Efforts to develop synthetic rubber have always been intensified in times of high prices and national emergencies. Research receives its greatest encouragement during such periods. Three such periods have existed in the past 40 years in the United States, namely in 1910, 1925 and 1941. The years 1910 and 1925 saw natural rubber at the highest prices ever recorded for this commodity. The year 1941 on the other hand was one of national emergency.

The price of natural rubber has fluctuated widely over the past 40 years.

In 1910 the price of natural rubber reached $3.00 a pound. The increasing requirements for natural rubber and the consequent high price at that time led to the first efforts in America to produce synthetic rubber.

In 1911 the Hood Rubber Company undertook a program of research with the object of developing a tire synthetic rubber. The early experiments were beset with many difficulties. Raw materials had to be synthesized in the laboratory by laborious methods, new techniques for the polymerization of the raw materials had to be worked out and finally the preservation of synthetic rubber presented new problems. The work before the declaration of war in 1914 had progressed to the point where it was realized that it would be impossible to commercialize any of the processes. In addition the decrease in the price of natural rubber had a dampening effect on the research. It is of interest that tires from the synthetic rubber were built and tested at that time.

In Akron, David Spence and a group of research men of the Diamond Rubber Company were also active from 1910-1912 on the problem of synthesizing rubber. They too had to synthesize the raw materials used in the polymerization process.

The Germans were also very active in the field of synthetic rubber during this period and during the war produced 2300 tons of "methyl" rubber. in the early work the metal sodium was used to effect polymerization.

In the United States, however, interest in synthetic rubber remained dormant until about 1921. In this year Dr. Ostromislensky and Dr. Maximoff began work on synthetic rubber for the United States Rubber Company. In 1922 they made butadiene synthetically from ethyl alcohol and acetaldehyde, and in 1923 they produced synthetic rubber from butadiene by the emulsion polymerization process.

By 1925 the price of natural rubber had again advanced to $1.23 per pound. Both in Germany and in America research on the development of a synthetic rubber was intensified. The Germans as well as the Americans devoted their efforts to a process differing radically from the one used during World War I and it was this emulsion process which was later to be used in this country on a large scale.

In 1925 the duPont Company became interested in the preparation of synthetic rubber from acetylene. Their research was based on work done by Father Nieuwland, Professor of Chemistry at the University of Notre Dame. He had been working on acetylene chemistry and had laid the foundation for the work which the duPont Company was to bring to fruition. In 1931 at a meeting of the Akron Section of the American Chemical Society, the duPont people announced to the rubber industry that they had succeeded in developing a new synthetic rubber called Duprene. The name was later changed Neoprene. In 1932—250 tons of this synthetic rubber were produced.

In 1920 J. C. Patrick while attempting to prepare a new antifreeze from ethylene dichloride and sodium polysulfide discovered instead a new rubber-like substance which he termed Thiokol. It was not until 1930, however, that Thiokol was produced commercially. In that year 4000 pounds were manufactured. Though not a true synthetic rubber it nevertheless finds wide use as an oil resistant spe-

cialty rubber. It is particularly useful where resistance to aromatic solvents is required.

In 1933 the first patent on Koroseal, a plasticized polyvinyl chloride possessing rubber-like properties, was granted to Dr. Semon. Koroseal though possessing rubber-like properties cannot be classed as a true synthetic rubber. In the same year the Firestone Tire and Rubber Company built and tested tires made from synthetic rubber.

In 1935 Germany announced the commercial production of the Buna synthetic rubbers. The word Buna is derived from the first two letters of the words "Butadiene" and "natrium." Butadiene is the main constituent of the Buna rubbers and natrium is the German word for sodium which was used in the polymerization.

In 1938 at the request of the Standard Oil Company of New Jersey, quantities of Buna S became available to the larger rubber companies in this country for tire testing. The German rubber, however, required heat softening before processing and the Amercian manufacturers did not react favorably to this additional treatment. Tires built at that time out of German Buna S did however show wear equivalent or superior to natural rubber tires. It should be mentioned, however, that it would not have been economical to produce German Buna S in large quantities in this country and in addition the extra processing required would have prevented its adoption in this country.

Buna N, the oil resistant type made from butadiene and acrylonitrile also became available in this country at this time. Simultaneously the major rubber companies and Standard Oil of New Jersey were engaged in pilot plant work on both Buna N and Buna S types.

In 1940 another synthetic rubber was announced by the Standard Oil Company of New Jersey. The rubber was called Butyl rubber. This rubber was an outgrowth of the work which was done on Vistanex or polyisobutylene. Two chemists working at the Standard Oil Company of New Jersey sought to change polyisobutylene so that it could be vulcanized like natural rubber. They first polymerized isobutylene with butadiene but later used isoprene. It was not until March 1943, however, that production was started on butyl. Because the polymerization requires extremely low temperatures many chemical engineering problems had to be overcome. The present capacity for butyl in this country is 68,000 long tons. Canada has an 8,000 ton plant which takes care of some of our needs in this country.

Thus at the time of Pearl Harbor there had been developed in this country several synthetic specialty rubbers namely, Neoprene, Thiokol, and Butyl. In addition the German types, Buna S and Buna N had been tested and similar American types were in the pilot plant stage. These developments were backed by years of research which had been intensified from about 1935 on. We were therefore not as unprepared for the emergency in 1941 as appeared to be the case. The big problem was to select one of a number of processes which had been developed for a general purpose synthetic rubber and to get into production as rapidly as possible.

After Pearl Harbor 90% of our supply of natural rubber was cut off and we had a stock pile of only 533,000 tons with an additional 100,000 tons afloat, less than the requirements for a normal year. The problems was met by the cooperative efforts of American industry and the Government.

### Principal Synthetic Rubbers and the Raw Materials from which they are made.

GR-S, the general purpose synthetic rubber which is being made in largest quantity today, is used principally in the manufacture of passenger tires. It is a copolymer of approximately 75% butadiene and 25% styrene. The butadiene is obtained either from alcohol or petroleum, the latter being the most economical source. Styrene is obtained by chemical reaction of benzene, a coal tar product, and ethylene which is obtained from petroleum. The polymerization is carried out in a soap emulsion and at the end of the reaction the latex is coagulated with either salt and acid or aluminum sulfate.

GR-A is made by essentially the same process used in making GR-S. It is a copolymer of butadiene with acrylonitrile containing from 15% to 40% of acrylonitrile. The oil resistance increases but the cold resistance decreases with increasing acrylonitrile content. During the war GR-A found its largest application in the manufacture of self-sealing fuel tanks, gaskets, cable covers, hose and rollers.

GR-M or Neoprene is made from acetylene and hydrochloric acid. The raw materials for acetylene are coal and lime, for hydrochloric acid salt and sulfuric acid. By chemical reactions of acetylene and hydrochloric acid chloroprene is formed which is polymerized to Neoprene by the emulsion process. Because of its remarkable chemical and oil resistance it is used in hose, belting, life saving equipment, gas masks and other mechanical goods.

GR-I or Butyl rubber is prepared by copolymerizing isobutylene with a small amount of isoprene (less than 5%). The reaction is carried out at very low temperatures. The outstanding properties of butyl rubber are its low permeability to gases, its resistance to water, sunlight, oxygen and ozone. These properties make it highly desirable for inner tubes, for wind and waterproof garments and for impregnating cloth for tents, balloons, etc.

GR-P or Thiokol is prepared by treating ethylene dichloride with sodium polysulfide. Its principal property lies in its resistance to gasoline and aromatic solvents and it therefore finds wide application in the manufacture of oil resistant hose, gloves, packagings, tank linings and other mechanical goods where oil resistance is required.

### Properties of the Principal Synthetic Rubbers

In a tread compound the tensiles of the synthetic rubbers are lower than natural rubber. The elonga-

(Continued on page 8)

## NEWARK ACTIVITIES

**By E. G. ACKERMAN**

It is predicted by Islyn Thomas, President, that the current season of the Newark Section shall be one of the most prolific of the Section's history, one that will be a criterion for all other SPE Sections to aim at. As far back as 1872 the Newark area has always been a dominant factor in the plastic industry and with the present heavy concentration of material manufacturers and molders of all types there is no reason why Newark, the seat of metropolitan New Jersey, should not retain its leadership of the plastics industry.

Mr. Harold Frutchey, Program Chairman, has announced for the current season a series of interesting and informative talks pertaining to all phases of the industry. Meetings will be held as usual on the second Wednesday of each month at the Newark Athletic Club with the exception of a few joint meetings later in the season which will be held in conjunction with the S.P.I. The first meeting, October 9, will be addressed by Mr. Charles Breskin of Modern Plastics and Mr. Burt Cash of Celanese Corp. whose topics will be "Plastics" and "Forticel" respectively.

In lieu of the September meeting a social affair was held in conjunction with the S.P.I. at the Old Oaks Country Club in New York, on September 10. The social consisted of a golf tournament, tennis matches and swimming followed by a dinner at the club house.

The Newark Section took to the ether over station WAAT last August 15 expounding the merits and limitations of plastics in the household. Taking part in the round table discussion on plastics over the Coffee Club program were Islyn Thomas, James Growley, and Art Warner, President, Secretary and Assistant Treasurer respectively, of the Newark Section. Besides being given a comprehensive picture of the many types of plastics and their uses, the listener was informed of the part the SPE plays as a professional society in insuring industrial progress through the intelligent use of plastics. The discussion among the three men lasted from 9:05 to 9:30 A.M.

As newly elected members of the Technical Societies Council of New Jersey the Newark Section will sponsor the September TSC calendar which lists the time, place and topics of various technical meetings and societies of New Jersey. With the election of the Newark SPE into this society each member automatically becomes a member of the Technical Societies Council.

## BLACK AT MILWAUKEE

The Milwaukee Section will meet September 26 to hear William Black speak on "Materials and Their Applications."

Mr. Black is Chief Chemist for Chicago Molded Products Corporation. His work at the present time is chiefly concerned with plastic materials and their specifications.

## PHILADELPHIA TO MEET

**BY MEYER SPERBER**

At our September lecture we will have Dr. C. W. Gaylor of American Viscose Corporation, Marcus Hook, Department Chemical Research. He will address us on the "Chemical Identifcation and Behavior of Certain Plastics." In other words, he will endeavor in simple chemical language to explain to Plastics Engineers the chemical whys and wherefores of low pressure and high pressure thermosetting plastics and behaviorism of other plastics such as vinyls. We are looking forward to a practical chemical education in the juggling of the atoms and molecules in the plastics field. We will also show a film by General Electric on the "Magic of Fluorescence."

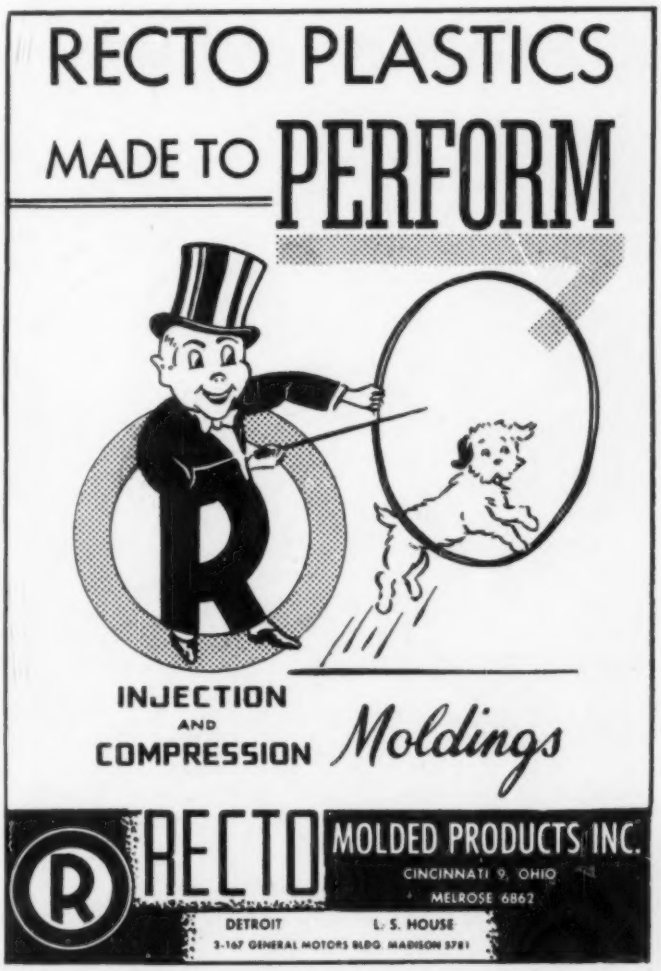
## New York Section Elects Officers

The New York Section Board of Directors has elected the following Section officers:

Robert Brinkema (Egmont Arens), President
David Murray (Boonton Molding), V. President
W. C. Peterson (Ideal Plastics), Treasurer
Arthur Nufer (Bakelite), Secretary

The Secretary's mailing address for SPE business is, 4 E. 41st Street, New York 17, N. Y.

Through an error it was announced in the June issue of the News that this section had been named Manhattan Section. This, however, is incorrect as the Section Directors have designated it as New York Section.



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## Western New England Section Organizes

Western New England Section held an organization meeting on June 27 under the able direction of Bill Dunnican, Eastern Regional Chairman of the National Membership Committee.

Section Directors elected were M. J. Petretti (Noma Electric), Frank Donahue (Monsanto), George Carlson (Arrow-Hart Hegeman), Jack T. F. Bitter (Parker Stamp), W. Larson (Modern Design), T. C. Roberts (LaPointe-Plascomold), E. G. Gray (General Electric), Henry Richardson (DeBel & Richardson), S. Ellingham (Wico Electric).

The Section officers are as follows: Mr. Petretti, President, Mr. Donahue, Vice President, Mr. Carlson, Treasurer, and Mr. Bitter, Secretary.

Western New England Section will serve our membership in the Hartford-Springfield and adjacent areas and from present indications will be a most active group.

Mr. Dunnican is organizing steering committees in several other New England centers and it is expected that there will be several Sections in New England before the end of the year.

## CLEVELAND PLANS FUTURE

**By GEORGE B. KOCH**

The Cleveland Section of the Society of Plastics Engineers has announced their plans for the first three meetings opening the 1946-47 year. The first meeting is scheduled for September 27th at the Cleveland Club, and an appeal is made for all members to attend this opening meeting.

The first Fall meeting and the opening of what promises to be a successful season for the Cleveland Section begins at eight p.m., September 27th at the Cleveland Club. Dinner at 6:30 will precede the opening of the meeting.

Cleveland Section will carry on in the usual tradition by having prominent and qualified speakers address this first meeting. A. R. "Ren" Morse, midwestern representative of Reed-Prentice Corporation, will talk on "Injection Equipment." Gregg Langemeyer, superintendent of The Pioneer Mold Company, will speak on "Recent Trends in Mold Designs," and Bill Johnson, of Plastics Engineering, Incorporated, on "Methods in the Mold Shop." A fourth speaker, as yet unannounced, will talk on "Material Supplier's Part in Successful Molding."

A meeting of all the Cleveland Section committees will follow the regular meeting, where a presentation of the foundation and plans for the entire year will be made. "Real Activity for Cleveland" is the theme for the coming year.

October 18th will see the Cleveland Section meet jointly with the Cleveland Chapter of the American Society of Tool Engineers. This meeting will be held at the Allerton Hotel and promises to be one of the "highlight meetings" of the season. Gordon B. Thayer, plastics research engineer for The Dow Chemical Company, Midland, Michigan, and Russell Bradshaw, plastics engineer also of The Dow Chemical Company, will be guest speakers. Mr. Thayer is the author of the well-known book "Plastics Molds."

Plans for the November meeting include a plant visit to Plastic Engineering, Incorporated, 8506 Lake Avenue, Cleveland, Ohio. Plastic Engineering will have new equipment installed by November and work on rearrangement of the entire shop will be completed by that time. A visit to this plant promises to be educational and interesting to all plastics engineers.

In keeping with the Christmas spirit, Cleveland Section plans to hold a social meeting in place of the regular technical meeting in December.

Cleveland Section is making plans for its part in the Third Annual National Meeting and Exhibit of the Society of Plastics Engineers to be held at Navy Pier, Chicago, Illinois, January 28th through February 2nd, 1947. The Society has reserved 500 hotel rooms in the Chicago area, so make your reservations early.

## BUFFALO SECTION MEETS

**BY CY PICKERING**

The last Spring meeting before the Summer recess was held at the Transit Valley Club Friday, June 21st.

Golf was the order of the afternoon followed by refreshments and dinner.

Mr. George V. Hammond of Owens Corning Fiberglas corporation was the evening speaker. His talk on "Fiberglas Reinforced Plastics" was very much worth while.

Meetings will be resumed in September.

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## SYNTHETIC RUBBER (contonued from page 4)

tions with the exception of Butyl rubber are likewise lower than natural rubber. GR-S is inferior to natural rubber in the following properties: Resistance to cold stiffening, wear, tear, cut growth, flex cracking and heat build up. GR-S is more difficult to process on a mill. GR-S exhibits less tack than natural rubber, but is more resistant to natural aging.

The outstanding property of GR-A is its resistance to petroleum solvents.

GR-M is more heat resistant than natural rubber. It is equal to natural rubber in resistance to flexing and rate of breakdown on the mill. The chemical resistance of GR-M is also superior to natural rubber and GR-S.

Butyl rubber is equal to natural rubber in resistance to flexing but is far superior in resistance to ozone and permeability to air. Butyl rubber and GR-S are not compatible. Butyl rubber is not affected by oxygen or chemicals such as nitric and sulfuric acids.

Thiokol has excellent solvent resistance to gasoline and aromatic solvents. It ages well, has good tear resistance and low permeability to gases. One disadvantage to Thiokol is its bad odor.

### Present and Future of Synthetic Rubber

It will be of interest to look at the present state of the synthetic rubber industry in the United States. There exists in this country capacity for the production of approximately 1,000,000 long tons of GR-S, 69,000 long tons of Neoprene, 68,000 long tons of butyl, and 33,000 long tons of GR-A. In addition Canada has a capacity of 30,000 tons of GR-S and 7,000 tons of butyl rubber. The peak United States consumption of new rubber in any peace time year was 781,000 tons in 1941. The total rubber consumption in the United States for the years 1946 and 1947 has been estimated at 900,000 tons and 875,000 tons respectively. Present estimates call for production of approximately 600,000 tons of general purpose synthetic rubber in 1946. It is not likely that more than 250,000 tons of natural rubber will be received during 1946 and possibly as much as 450,000 tons in 1947. It is thus apparent that a high level production of general purpose synthetic rubber must be maintained over that period.

Butyl rubber will continue to be in demand for inner tubes and other mechanical uses. Its use for inner tubes depends on its low permeability to air, being about 1/10 that of GR-S or natural rubber.

Neoprene and GR-A will continue to be in demand as specialty oil resistant rubbers, and can undoubtedly stand on their own.

In order to insure the future of synthetic rubber in this country and avoid a recurrence of the 1941 emergency, Mr. Snyder, Director of War Mobilization and Reconversion, in the fall of 1945 created a committee to report on a number of critical questions having to do with rubber. The Inter-Agency Policy Committee on Rubber of which Wm. L. Batt was Chairman, was formed and after a careful study of the rubber situation issued a report covering its findings and recommendations early in March. The main points in the committee's long-term recommendations were as follows:

1. *That for purposes of national security, the Government should ensure that a minimum amount of general purpose synthetic rubber is produced and used in the United States.*

In the light of the best knowledge it was estimated that after present replacement demands are satisfied approximately 750,000 long tons of general purpose rubber will be consumed yearly. The committee recommended that one-third of this amount (exclusive of special purpose synthetic rubber) or about 250,000 long tons should be general purpose synthetic rubber.

2. *The synthetic rubber industry should be privately owned and operated.*

The committee felt that healthy competition in the synthetic rubber industry would thus be achieved and would provide the best incentive to vigorous research and development and the greatest assurance of substantial quality and price improvements.

3. *The remaining efficient general purpose synthetic rubber facilities not financed by private owners, including at least one alcohol butadiene plant should be maintained by the Government in stand-by condition.*

The total capacity of the presently efficient petroleum butadiene plants plus one alcohol butadiene plant is sufficient to produce approximately 600,000 long tons of GR-S per year. Under the committee's recommendations there would therefore be retained in operation or stand-by condition about 60 per cent of this country's existing GR-S capacity.

4. *The United States should establish a revolving strategic stockpile of natural rubber for security purposes.*

As long as synthetic rubber is inferior to natural rubber for use in items such as truck and plane tires and medical equipment, natural rubber is a key to our security. A natural rubber stockpile is therefore required.

In summary therefore it may be said that the synthetic rubber industry in America has become of age. A very good general purpose synthetic rubber has been developed and though not equal to natural rubber in all respects will give as good or better trouble-free mileage in passenger tires as the pre-war natural rubber and at a cost comparable to natural rubber.

Several specialty synthetic rubbers have been developed such as Butyl, Neoprene, GR-A and Thiokol. These are superior to natural rubber in certain respects such as oil resistance, sunlight and ozone resistance and permeability to air. The number and use of such specialty rubbers should increase. Such specialty rubbers will be in demand even though the price may be higher than natural rubber because of their unusual properties.

## INDIANAPOLIS REPORTS
**BY W. O. GEBHART**

In the evening of the first day of summer, 1946, twelve members and two guests enjoyed a program planned by I. P. Scott. Your reporter is indebted to Eugene Quear for his excellent notes that made possible this report.

Mr. Behr, Monarch Machine Tool Company, Sidney, Ohio, presented a film showing the progress of the machine tool industry since the early days, featuring a trip through the Monarch plants. Of great interest were the scenes of flame hardening the ways of lathes, of precision grinding, and of alignment.

Another four hundred feet of film pictured the setting up and the operation of a Monarch Shapemaster Lathe. This lathe is equipped with three dimensional Kellar contour controls. An entire mold with flutes, bassies, and ribs was finished completely on the lathe with a single point cutting tool.

The film also demonstrated that squares, hexagons, or octagons with sharp corners can be bored or turned and that the desired shapes can be produced at various diameters on the same piece.

These facts are interesting:

1. Only one machine was built prior to the war.
2. Approximately eighteen have been built since the war started.
3. Over fifty per cent have gone to foreign countries.
4. The machines are accepted primarily by the glass industry (up to now).

Mr. Behr gave each person present a two piece molded ash tray produced from a mold that was finished completely on a Shapemaster. Let that be a lesson to you absent members.

Be at the September twentieth meeting and see what Ralph Waddington has in store for you.

## ST. LOUIS MEETS SEPT. 20
**By DAN OTTO**

There will be a dinner meeting of the St. Louis Section of the Society of Plastics Engineers on September 20 at the DeSoto Hotel at 6:30 p.m.

While we have been inactive during the summer, we have planned a very active program for the fall and winter months.

For our September meeting we will have for our speaker Mr. J. C. Kazimier of the Amos Molded Plastics, Edinburg, Indiana. Mr. Kazimier will speak on "The Importance of Engineering and Selling."

The St. Louis Section of the Society of Plastics Engineers, Inc., held its monthly dinner meeting on June 17 at the DeSoto Hotel. The guest speaker was Mr. G. W. Borkland, of the Borkland Laboratories, Marion, Indiana. His talk covered the process of forming thermoplastic sheets such as acyrlic, acetate, and ethyl cellulose over a positive die.

Many samples were displayed and several were of complicated shapes indicating the high degree of skill on the part of the operator.


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## CHICAGO ENJOYS GOLF

**By JAMES A. BOYAJIAN**

The 1946 SPE Golf Tournament held on Friday August 16th was well attended by 120 of the Society's golf enthusiasts at the Elmhurst Country Club.

A perfect day afforded many of the players a day of refreshment and relaxation, allowing them to depart from their usual business worries, shortage of material, labor difficulties, etc. Jim Ferguson of Plaskon Corp. carried off high honors for the day with a low score of 75 thereby winning the SPE trophy which he will keep for one year. The Blind Bogey was won by Ed Bachner, Sr., of Chicago Molded Products with a net of 92.

**Chicago Section Golfers Relax**

After the tournament everyone enjoyed a fine dinner at the club house. To add further enjoyment of the dinner, the Mid-States Four, who are the 1946 Illinois Barber Shop Quartet Champs, entertained the members with their melodious harmony. After dinner many of the members settled down to an evening of golf yarns and the All American game of poker.

## MIAMI VALLEY PLANS TECHNICAL ACTIVITIES

**BY G. J. WILSON**

During the months of July and August there were no scheduled Section meetings of the Society.

Dr. O. W. Leibiger, of the Miami Valley Section, SPE, is chairman of the local Professional Activity Group in "Chemical Investigation of Plastics Materials." His experience in this phase of plastics work and his desire to develop an active group interest in the chemical aspects of plastics, will be a contribution to Miami Valley Section members interested in such problems. It is planned to initiate group meetings for discussion of these problems as quickly as possible, and probably before the fall sessions begin. Members will be contacted and given details of meeting place and time in a forthcoming issue of DATEC.

Frank Schneider, local chairman of the "Materials and Molding Technique Group" (another Professional Activity Group), is in the process of contacting all members who have registered interest in that phase of plastics engineering work. As a memory refresher, they are: J. G. Braden, V. E. Calvin, G. W. Carpenter, C. Frank, W. A. Hames, H. J. Kasch, Jr., C. H. Kruger, B. W. Nelson, L. J. Rawson, R. T. Schwartz, and B. C. Stupp. This work should be of interest to a large number of members. Anyone whose name is not listed and who desires to cooperate in this program should contact Mr. Schneider, at the Inland Manufacturing Company, Dayton, Ohio.

On June 25th and 26th a meeting of SPE members and officers was held in Buffalo and attended by representation from S.P.I., P.M.M.A., and A.S.T.M. Mr. W. Hess, of the Chicago Professional Activities Groups, called the meeting for the purpose of discussing interlocking technical investigation programs that might be developed between the four groups. On the assumptions that SPE literally means an engineering organization it was considered that it could and should supplement the other organizations in a unified attempt to define the problems of the plastic industry and supply technical information which has never been systematically available heretofore.

Robert G. Chollar, National Chairman of the Professional Activity work in End Use Specifications, attended the meeting and reported on the scheme and progress of work in this category of the Professional Activity program. He was also appointed National Vice-Chairman of the Professional Activity Committee and will actively work toward development of the program in its engineering objectives.

## PLASTICS ENGINEER (Continued from page 1)

material has made jobs that look impractical successful. Careful design in several instances on record made it possible to use less expensive materials.

The plastics engineer has to know his materials, not just those of one manufacturer but all plastics. In this extensive and growing list, however, he, of course, has the advantage of the individual material manufacturers' staff intimately acquainted with their own company's products.

The plastics engineer's knowledge should go beyond the materials and their practical use. He should, for example, be informed on the possibilities of metal plating, for informative markings and decorative effects have hardly been touched and offer many opportunities for new styling. Sprayed coatings, outside the radio field, have been limited. They present through the new phenolic resin-base enamels definite possibilities for attractive decorative effects, as well as for all over coatings. Coatings that will neither readily chip or mar are ammunition for the informed plastics engineer in the competitive days which will come—come maybe sooner than we know, and will make a place for the plastics engineer more important in the scheme of things than he ever had in the past.

## MIAMI VALLEY NEWS

**By G. J. WILSON**

The first meeting of the fall season was held on September 5th. Mr. P. M. Koons, industrial designer of The National Cash Register Company, presented a stimulating discussion entitled "What Is Product Design?"

Mr. R. G. Chollar has been appointed co-chairman of the National Technical Activities Committee. His interest in the technical programs, which are envisioned as a major part of the Society's agenda, will be of value to all those who hope to see increasing activity in this field.

In the Miami Valley Section, chairmen have been selected for each of the local Technical Activity Groups. They are:

F. Schneider, Materials and Molding Technique

B. K. Green, Coatings

J. E. Baxter, Product Design

O. W. Leibiger, Chemical Investigation

B. W. Nelson, Consumer Specifications

W. Moore, Tool Design

V. Calvin, Laminates

All those interested in participating in one or more of the above technical programs should contact the respective chairman.

Members and applicants for membership from the Cincinnati area are again participating in the activities of the Miami Valley Section. The mutual support of SPE by Dayton and Cincinnati members will be encouraged, and it is hoped that meetings may be held alternately in Dayton and Cincinnati or midway points during the coming season.

This year promises to be the biggest yet for the Miami Valley Section. Programming will be maintained for maximum interest of all members and the Technical Activities work will provide a sound basis for continued development of an engineering group.

## CHEMACO APPOINTS SPAIN

Announcement that Maurice Spain, Jr., has been appointed New England sales representative of Chemaco Corporation, Berkeley Heights, N. J., was made recently by Walter J. A. Connor, Vice President and Director of Sales.

As New England Representative Mr. Spain will handle the sales of Chemaco thermoplastic molding materials namely: cellulose acetate, ethyl cellulose, and polystyrene. These materials are produced by the Manufacturers Chemical Corp., the parent company of Chemaco at the same address.

Mr. Spain became associated with Chemaco following his separation to inactive duty as a lieutenant from the U. S. Naval Air Corps Reserve. He is a graduate of Wharton School of Finance and Commerce of the University of Pennsylvania and prior to his entering th service was associated with Sillcocks-Miller Company.


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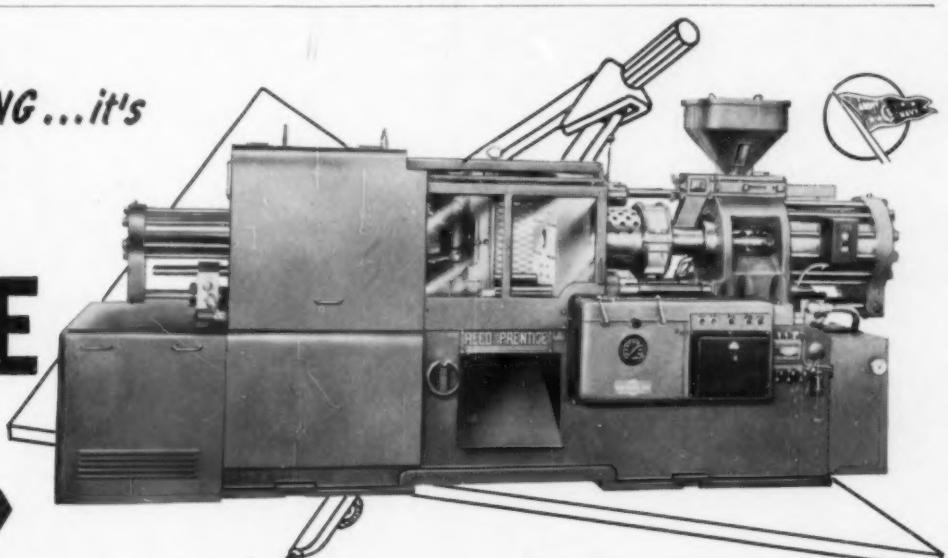


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## BRITISH SEEK U. S. PLASTICS MARKETS

### Will Base Competition on Lower Costs for Quality Products

British Plastics manufacturers are already eyeing American markets, Henry W. Harding, president of the Manufacturers Chemical Corp., who has just returned from a trip to England and France declared over the weekend.

The final passage of the Angle-American Trade and Financial Agreement, plus new regulations over raw materials has created a high degree of optimism among British plastic material manufacturers and molders who up to now have had insufficient raw materials to produce products for export and who have been unable to purchase these materials because of their lack of dollars, he said.

Having decided that they can produce plastics of quality comparable to those made in the United States and at a lower cost, several concerns are contemplating entry in the American market now that they will be in a better position in the next two years to supply goods which are scarce, Harding said.

Extensive projects are under way in England to expand the production facilities for basic chemicals that the plastics industry uses as raw materials. The vastly increased production of chemicals is the first step in the expansion of Britain's plastics industry. It will be accomplished by the formation of

(Continued on page 14)

## N. W. PENN. HAS OUTING

**By PAUL ROCHE**

Welcoming a get-together during the three month summer recess from regular monthly meetings, the Northwestern Pennsylvania Section sponsored an outing and dinner for its members on Thursday, August 22 at Tiemann's, 1022 Wyoming Avenue, Erie, Pennsylvania. About twenty-five members were in attendance, enjoying the outdoor splendor, horseshoe pitching, and refreshments. Door prizes were distributed to all members in attendance, consisting of plastics items produced by local manufacturing concerns. After a tasty dinner, a "tall story" contest was held, in which the competition was so rugged and formidable on all sides as to render impossible the decision on a winner.

The 1946-1947 meeting season will open up very strongly with a talk on a very basic subject by a well known and capable speaker. Mr. Gordon B. Thayer of Dow Chemical Company will cover "Design and Cost of Plastic Molds" on Wednesday, September 11, at the Kenyon Hotel in Erie. This new meeting place is expected to be very satisfactory for our needs; the new plan of operation at the Erie Press Club necessitated a change of location.

The subject to be treated at the September meeting was arrived at in a poll conducted by ballot during the summer, in which the members of the Northwestern Pennsylvania Section participated. "Design and Cost of Plastic Molds" was found to be the most popular among fifteen proposed subjects submitted for vote. Eight others were also selected on the basis of popularity, which will form the foundations for the other meetings of the 1946-1947 season. Another ballot was circulated among the Section Directors, as a result of which the meeting night was changed from the fourth Thursday of the month to the second Wednesday. This was a necessary change, since the regular schedule during the first season of the Section's existence conflicted with the meetings of several other local organizations.

During August Mr. J. P. Murphy became associated with the Quinn-Berry Corporation at 2601 West 12th Street, Erie, Pennsylvania. Mr. Murphy comes well qualified to his new post, having been associated with Erie Resistor Corporation (Plastics Division) for over fifteen years as a Process Engineer, and is also a director of the Northwestern Pennsylvania Section. The Quinn-Berry Corporation is an injection molding plant.

Mr. Richard W. Welch recently accepted a designing position with Nosco Plastics at Erie, Pennsylvania, having been associated previously with Continental Rubber Works of Erie, Pennsylvania.

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## THIRD EDITION OF "PLASTICS MOLDS"

The new third edition of "Plastics Molds," by Gordon B. Thayer, will be published in September. The new edition contains several new sections and over 200 illustrations. The original text carried over from earlier editions has been revised and enlarged. The new volume should uphold the position of this book as the standard on this subject.

## NATIONAL ORGANIZATION

(Continued from Page 2)

National SPE desires ardently to cooperate with its Sections and individual members in every possible manner. Listed below and presented with a short discussion are a few services National SPE performs:

### 1. Professional Activity Groups

In the Professional Activity Groups, the membership of the Society is segregated into the various technical phases of plastics, and thus the talent of all Sections is coordinated into the several Activity Groups. Under the direction of the National Chairman of Professional Activities, seven Groups have been established, as follows: Product Design, Molding Materials, Laminates, Coatings, Tool Design, Consumer Specifications and Molding Technic. Other Groups and sub-groups will be created as they are needed or desired by the members.

It is intended that the various Professional Activities act as independent units, with their work coordinated through the National Chairman. Any member may participate in any one or more of the Professional Activities, and every member should participate, as this combining of talent from all Sections is one of the great advantages of a national engineering society.

It has been necessary for SPE to acquire a substantial membership of technical men in various areas of the country before these Professional Groups can operate properly. Considerable time is required for such a program, and it may be another year or more before the Technical Groups are producing worth-while contributions along the lines of engineering standards etc. The more that individual members participate in these Groups, the greater will be the return to those who participate. In other words, the value of these Groups depends directly upon the members themselves.

### 2. National Meetings

SPE conducts an Annual Technical Meeting, and as the Society grows there will undoubtedly be the need for midyear regional meetings. Through the cooperation of the Professional Activity Groups and the Meetings Committee, a program of outstanding technical power is arranged.

The consensus of those who attended the last Technical Meeting in Detroit was that (1) the program was the most comprehensive symposium on plastics ever assembled, (2) the speakers were an outstanding group of plastics engineers, and (3) no other organization except SPE can make possible such a contribution to the technical progress and development of the industry.

### 3. Publications

A. Technical Proceedings—The Proceedings of the National Technical Meeting are published and mailed to every member. Requests for this important publication have come to us from almost every country.

B. The SPE News—This publication is printed ten times throughout the year. It is our intention to publish two technical papers with each issue. One issue is the Directory Issue, usually the June issue. News items from all Sections will be printed. Individual news items will be printed. Questions will be answered by a special Committee. In every manner this publication attempts to serve. It is our ambition that the SPE News will make an outstanding contribution to plastics literature as years go on. The SPE News is supplied without cost to all members.

C. Ring Binders—Due to mass purchasing for the entire Society, these binders are provided at low cost to Sections, and members. They are a convenient means of filing Proceedings and Technical Papers.

### 4. National Office

Through the National Office, the officers and directors of the various Sections are given every possible assistance and cooperation in the operating of Section affairs. The Sections have been relieved of much clerical work in the handling of dues and finances and of maintaining an accurate roster of members. Addressing equipment has been on order for over six months. When this equipment is received, the National Office will be able to offer addressing and mailing service to the Sections for local meeting notices etc.

### 5. Committee Work

For the guidance of the Sections' Committee work, National Committees are set up and active in all fields of endeavor to assist local Committees in their work.

Regarding all of the above please bear this in mind. National SPE is a young and growing organization. It may not yet have the equipment or personnel to give you just what you want instantly, but it will do its best. Also think of this, that best cooperation works both ways. Often we may be hindered in serving you due to the fact that some local Committee or Officer has not acted due to other pressures. In short National SPE will do all it can. And National SPE solicits your constructive criticisms and suggestions as to how we can better serve.

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## BRITISH (Continued from page 12)

joint British-American companies and by the use of American production methods, he revealed.

Manufacturers are working in close collaboration with raw materials suppliers to further developments and techniques. Many companies have allocated substantial amounts of capital for new laboratories and research projects. The Institute of the Plastics Industry has launched a vast educational program designed to inform manufacturers and the British public of the new and the old plastics materials, their properties, their uses and their limitations.

The material supply situation in both England and France is far more serious than in the United States. In England, polystyrene is in very limited use, although it has become a major plastic material in the United States due to the wartime synthetic rubber program. Cellulose acetate, acrylics and vinyls are widely used but not in great volume. The prices of these plastics which are from 50 to 300 per cent higher than in the United States, limits their use.

Chemaco Corporation, a subsidiary of Manufacturers Chemical Corp., and which Mr. Harding heads is producing the equivalent of at least two-thirds the amount of celluicse acetate and ethyl cellulose produced in England and three times as must as is produced in France, Harding said.

No materials or plastic products were produced for civilians in England during the war. Although British plastics manufacturers increased their production during the war and introduced new superior plastics for war uses, England lags about seven years behind the United States in plastics manufacturing progress, especially in mass production methods.

Although manufacturers' plans call for a vastly enlarged capacity, it will take about two years before the necessary equipment can be completed.

On the production development of plastics in England will hinge the peacetime prosperity of the chemical industry, tool and die making, machinery manufacturers, forest products producers and manufacturers of many lines of consumer goods in England and other countries.

England and France both hope to have Germany and other occupied countries as their markets if they can gain these outlets before Russia does. Before the war, Germany had a highly developed plastics industry especially in raw materials and chemicals. They exported acetate, nitrocellulose and polystyrene at prices considerably below British domestic prices.

While little is known of the condition of the German plants, it is feared in some quarters that the Russians have moved all worthwhile production facilities to their homeland.

Harding, who is also president of Chemaco Corp., a subsidiary of the Manufacturers Chemical Corp., went abroad in an advisory capacity at the request of large British plastic material manufacturers and to make a survey of new developments and techniques in the plastics field.

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## PLASTICS SHOW (Continued from page 2)

SPE will open an office in Chicago later this month to handle all business connected with the Show. Until the Chicago office address is announced, however, all communications should be addressed to the National Office, Theatre Building, Birmingham, Michigan.

Floor plans of the exhibit space and detailed information is being mailed to prospective exhibitors. Mr. Reinecke states that reservations had been received from 26 exhibitors prior to announcement of the floor plan.

The Hubbard Erickson organization will be in charge of Show services and Richard R. Smith & Associates of Chicago will handle Show publicity.

The following Chairmen of sub-committees have been appointed by Mr. Reinecke.

Registration Committee—Chairman, L. H. Amrine, President, Imperial Molded Prod. Corp., Chicago, Ill.

Finance Committee—Chairman, H. J. McGowan, Bakelite Corp., Detroit; V. Chairman, W. F. Cooper, Jr., Tennessee-Eastman Corp., Chicago.

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Banquet Committee—Chairman, C. C. Henry, Chicago Die Mold Mfg. Co., Chicago.

Publicity Committee—Chairman, J. A. Boyajian, Product Mfg. & Eng. Corp., Chicago; V. Chairman, M. H. Froelich, Plastics Magazine, Chicago.

Hotels Committee—Chairman, T. E. Richards, Midwest Molding & Mfg. Co., Chicago.

Exhibits Committee—Chairman, W. B. Hoey, Birmingham, Michigan; V. Chairman, E. E. Woodman, Durez Plastics & Chemicals, Inc., Chicago.

Reception Committee—Chairman, Arthur Lovgren, Industrial Molded Products, Inc., Chicago.

Decorations Committee—Chairman, Forest Wilson, Barnes & Reinecke, Chicago.

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**WANTED—PRODUCTION ENGINEER**

With experience, vision, aggressiveness, and record of accomplishment. Should be able to provide experienced direction for tool room, molding and fabricating. Small plant in midwest now doing compression molding and fabricating but planning extensive expansion to include injection and extrusion. Good opportunity for right man. Apply by letter, stating education, experience and salary expected. SPE News, Box 2.


PAUL WILLIAM LAVIN, Supervisor Quality Control
Owens-Illinois Glass Co., Closure Div.
RR No. 3, Box 501A, Bancroft St., Toledo 7, Ohio
DELFORD A. McGRAW, Project Engineer
Owens Illinois Glass Company
1510 N. Westwood Avenue, Toledo, Ohio
CARLTON A. RICHIE, Plastic Res. Dept.
Owens-Illinois Glass Co.
1510 N. Westwood Avenue, Toledo, Ohio
GEORGE ALEXANDER TAYLOR, Service Eng.
Plaskon Div. Libbey-Owens-Ford Glass Co.
2129 Collingwood, Toledo 2, Ohio

## WESTERN NEW ENGLAND SECTION

**Member**

BERNARD ULVAD, Designer
Foster-Grant Co., Inc.
3 Nelson Street Extension, Leominster, Mass.

# INCOME AND EXPENSE STATEMENT

**SOCIETY OF PLASTICS ENGINEERS, INC.**

**June 30, 1946**

| | FOR THREE MONTHS ENDED JUNE 30, 1946 | | YEAR TO DATE | |
|---|---|---|---|---|
| | BUDGET | ACTUAL | BUDGET | ACTUAL |
| **INCOME** | | | | |
| Income for 1946 National Exhibit | $ | $ | $17,000.00 | $17,484.16 |
| Dues earned | 1,937.50 | 1,881.71 | 3,875.00 | 3,437.75 |
| Proceeds from sale of stationery to Sections | 125.00 | 84.81 | 250.00 | 374.65 |
| Profit on sale of binders to Sections | | | | 161.13 |
| Proceeds from sale of lapel buttons | 75.00 | | 150.00 | 7.00 |
| Miscellaneous | | 44.82 | | 44.82 |
| TOTAL INCOME | $2,137.50 | $2,011.34 | $21,275.00 | $21,509.51 |
| **EXPENSES** | | | | |
| Administrative and general | $4,122.50 | $4,812.78 | $ 8,245.00 | $ 8,862.75 |
| Promotion | 575.00 | 784.44 | 1,150.00 | 790.44 |
| Publications | 475.00 | 1,262.96 | 950.00 | 1,683.00 |
| Professional activities | 250.00 | 81.02 | 500.00 | 158.39 |
| Miscellaneous | 250.00 | 223.39 | 500.00 | 336.07 |
| TOTAL EXPENSES | $5,672.50 | $7,164.59 | $11,345.00 | $11,830.65 |
| NET INCOME (or Loss*) | $3,535.00* | $5,153.25* | $ 9,930.00 | $ 9,678.86 |

Note A—The budgeted amounts shown for income and expense represent one-half of the annual budget except income from the 1946 National Exhibit which is the total for the year.

Note B—Initiation fees have been credited directly to surplus and have not been included in the income and expense statement for the reason that they may vary considerably from year to year and, may distort future comparative statements of income and expense.

is a National Engineering Society with a membership comprised entirely of individuals, the objects of which are to promote in all lawful ways the Arts, Sciences, Standards and Engineering Practices connected with the use of plastics.

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